DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 March 2010 has been entered.

Claim Rejections - 35 USC § 103

2. Claims 1, 6-7, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038).

3. Momoda et al. (EP 1130038) disclose a curable composition comprising (A) a polymerizable monomer, (B) a polyfunctional polymerizable monomer, (C) a difunctional polymerizable monomer, and (D) a photochromic compound.

4. Component (A) is considered to be Applicants' component (III). Specific embodiments include polyethylene glycol methacrylate having an average molecular weight of 526 and methyl ether polyethylene glycol methacrylate having an average molecular weight of 360 [0037].

5. Component (B) is Applicants' component (I) [0050, formula (4)]. Specific embodiments include trimethylolpropane trimethacrylate and trimethylolpropane triacrylate [0052].

6. Component (C) is Applicants' component (II) [0057, formula (5)]. Specific embodiments include BPE (2,2-bis(4-methacryloyloxyethoxyphenyl)propane), diethylene glycol dimethacrylate and triethylene glycol dimethacrylate [0062].

7. Momoda '038 discloses the weights of (B) and (C) together, i.e. "…[(B) and (C)] are used in amounts of from 50 to 99% by mass…based on the total mass of the monomers…" [0069]. They then disclose the individual monomer weights in terms of the sum of both monomers: (B) is 2 to 50% by mass based on the sum of weights of (B) and (C), while (C) is 50-98% by mass based on the same sum. The following example shows how the weights overlap with those claimed by Applicants. If (B) and (C)

combine to make 50% of the total weight of all monomers, and (B) constitutes 20% by weight of the sum of (B) and (C), and (C) constitutes 80% by weight of the same sum, then component (B) constitutes 10% of the total weight of all monomers and (C) constitutes 40% of the total weight.

8. The following table summarizes the weight percentage values (based on total weight of all monomers) for the instant application and Momoda '038:

Table I

	'038	*Claim 1*	*Claim 6*	*Claim 7*
(A)/(III)	1-50%	5-89%	5-89%	30-77%
(B)/(I)	1-50	1-15	1-15	3-10
(C)/(II)	25-97	10-80	10-80	20-60

9. On the one hand, as seen in Table I, Momoda '038 clearly meets all the presently claimed weight percentage values. On the other hand, as set forth in MPEP 2144.05, in the case where the claimed range "overlap or lie inside ranges disclosed by the prior art", a *prima facie* case of obviousness exists, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

10. The examiner takes the position that the cured product of these compositions would have tensile strengths close enough to said strength that it would have been obvious for one of ordinary skill in the art to optimize the ratio of monomers to achieve a product with higher tensile strength. One of ordinary skill would appreciate that the ratios of monomers used would affect the resultant tensile strength because of their varying hardness values. Lenses must be able to resist impacts and drilling in order to be of use. As such, one of ordinary skill would recognize the necessity of creating a lens that can withstand a baseline amount of abuse. Thus, one could reasonably experiment with the conditions of the invention to arrive at a tensile strength greater than 20kgf.

11. Component (D), like component (IV), is a photochromic compound, e.g. fulgimide and spirooxazine compounds [0081]. The half-life period of photochromic compounds (IV) is known to decrease upon transitioning from a polymerizable solution to a polymerized product [0004]. Although '038

is silent with regard to a cured product with a photochromic compound having a fading half-life of less than 30 times the half-life found in the curable composition, the examiner takes the position that the compositions inherently possess such properties. For example, Example 37 uses chromene 2, which is the same as chromene 2 of the instant application, and has a half-life of 0.7 minute. Although these examples are not fully analogous, they exemplify how, because of the broad range claimed, most any photochromic compound would exhibit half-life properties as claimed in the present invention in most any composition. Furthermore, one of ordinary skill in the art could arrive at such a property without undue experimentation because of the broad range.

12. Thermopolymerization initiators, corresponding to present component (V), such as benzoyl peroxide can be used in the composition [0098].

13. With regard to the limitation of a photochromic lens substrate found in claim 1, Momoda '038 teaches a lens material made from the composition [0094].

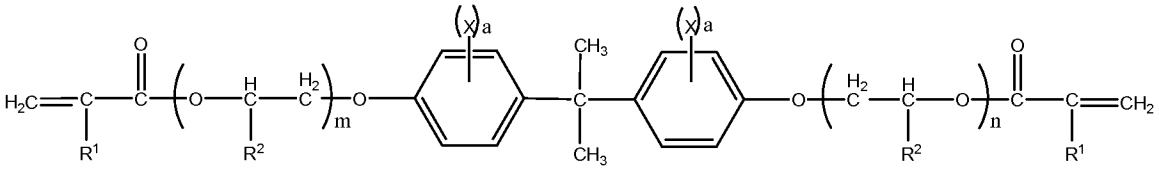
14. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038) in view of Imura et al. (U.S. 5,556,931).

15. Each claim presents a further limitation of an independent claim. Specifically, each claim further limits component (II) such that it is composed of two compounds each according to formula (2). Type one has a sum of (m+n)=0 to 5. Type two has a sum of (m+n)=6 to 30. Type two is present in a molar amount of no more than three times as much as type one.

16. Momoda '038 discloses the cured compositions of the parent claims as previously described.

17. While Momoda '038 discloses a value of (m+n)=2 to 6 on average, the reference is silent with regard to higher (m+n) values [0057 p10 ln 12].

18. Imura et al. disclose the following formula (I) for use in a lens substrate:



(I)

19. As the integer *a* can equal zero, this is the same as Applicant's formula (2) (col 3 ln 1+).

20. Imura et al. disclose that each of m and n can be an integer from 1 to 15 (col 3 ln 55). They further teach that compounds with values of (m+n)=2 to 3 are very hard (col 5 ln 2), while those with values of (m+n)=6-12 are less hard, but better resist impacts (col 5 ln 24-29). Values over 12 result in even softer compounds (col 5 ln 29-32).

21. At the time of the invention, it would have been obvious to one of ordinary skill in the art to mix the hard and soft monomers in various ratios until a product with desired hardness, tensile strength and impact resistance was produced. One of ordinary skill would appreciate that having too much of monomers with (m+n) values over 12 would result in very soft compounds, and so would limit the amount of higher molecular weight monomers.

22. However, note that while Imura et al. does not disclose all the features of the present claimed invention, Imura et al. is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely the proportions of monomers having different (m+n) values should be varied to achieve desired physical properties of a finished product and in combination with the primary reference, discloses the presently claimed invention.

23. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038) in view of Geffcken et al. (U.S. 3,713,869).

24. Claim 12 is directed toward the cured compositions of claim 1, wherein the substrate has a hard coat layer and a buffer layer. The buffer layer is located between the substrate and the hard coat layer, and has a lower pencil hardness than the hard coat layer.

25. Momoda ‘038 teaches the use of a hard coating agent to create a thin film on the cured product [0103] as in claim 12. Momoda ‘038 is silent, however, with regard to the use of a buffer layer interposed between the substrate and the hard coating layer.

26. The use of intermediate (or buffer) layers to promote adhesion between a hard coating and a lens substrate is well-known in the art. For example, Geffcken et al. disclose the use of an intermediate layer

between a hard inorganic layer and a plastic substrate (col 2 ln 56+). The polymer-based intermediate or primer layer improves the adhesion of hard layer to the plastic substrate; said intermediate layer would inherently have a pencil hardness less than the hard inorganic layer.

27. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use a softer polymer-based buffer layer between the hard coating layer and the lens to promote adhesion between them.

28. Note that while Geffcken et al. does not disclose all the features of the present claimed invention, Geffcken et al. is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely softer intermediate layers promote adhesion between a hard outer coat and a plastic lens and in combination with the primary reference, discloses the presently claimed invention.

Allowable Subject Matter

29. Claim 16 is allowed.

30. The following is a statement of reasons for the indication of allowable subject matter:

31. Applicant's limitation that "the polyfunctional polymerizable monomer represented by formula (1) is at least one selected from the group consisting of caprolactam modified ditrimethylolpropane tetraacrylate, caprolactam modified ditrimethylolpropane tetramethacrylate, and caprolactam modified dipentaerythritol hexaacrylate" has overcome the prior art of record.

32. Component (B) of Momoda '038, which corresponds to Applicants' component (I), can be any polyfunctional polymerizable monomer that exhibits an L-scale Rockwell hardness of not smaller than 60 when homopolymerized [0047]. Although Applicant indicates in the present specification that the caprolactam-modified compounds satisfy the hardness requirements, there is no disclosure in Momoda '038 of caprolactam-modified ditrimethylolpropane tetraacrylate, caprolactam-modified ditrimethylolpropane tetramethacrylate, and caprolactam-modified dipentaerythritol hexaacrylate as

required in present claim 16. The "closest" such disclosure was found in Momoda US 2003/00085958, which discloses caprolactone-modified dipentaerythritol hexaacrylate has an L-scale Rockwell hardness of more than 60 [0039-40].

Response to Arguments

33. Applicant's arguments filed 18 September 2010 have been fully considered but they are not persuasive.

34. Regarding rejections based on Momoda (EP 1130038):

35. Applicant submits the examiner has not set forth a *prima facie* case of obviousness. The examiner respectfully disagrees, as the examiner has set forth a proper motivation for an artisan to arrive at the presently disclosed invention in the rejections of record.

36. As noted in previous rejections, the amounts of monomers disclosed by Momoda '038 significantly overlaps with the presently claimed amounts. To illustrate, see the following table:

Table I

	'038	*Claim 1*	*Claim 6*	*Claim 7*
(A)/(III)	1-50%	5-89%	5-89%	30-77%
(B)/(I)	1-50	1-15	1-15	3-10
(C)/(II)	25-97	10-80	10-80	20-60

37. Furthermore, exemplary monomers disclosed by Momoda '038 include the exact same exemplary monomers disclosed by Applicant for all three monomers. One of ordinary skill would recognize the necessity of creating a lens that can withstand a baseline amount of abuse. Thus, one could reasonably experiment with the conditions of the invention to arrive at a tensile strength greater than 20kgf.

38. Regarding the data presented in the Declaration filed 20 Feb 2009, the examiner again notes only examples 10, 11, 15, 24, 25, 34, and 35 disclose the required three monomers of the present claims. The other examples use monomers not relied upon for the rejection. Furthermore, the examiner notes his position is that one could reasonably experiment with the conditions of the invention to arrive at a tensile strength greater than 20kgf.

39. Regarding rejections based on Momoda '038 in view of Imura '931:

40. The examiner does not argue that Imura does not disclose the present invention; it is used as a teaching reference. The examiner takes the position that one of ordinary skill in the art would recognize that varying the (m+n) values would result in different properties for the final lens product, and could use Imura as a guide as to what properties would result.

41. Regarding rejections based on Momoda '038 in view of Geffcken '869:

42. The examiner takes the position that although Geffcken is silent with regard to the present invention's lens substrate, the teaching reference is evidence that using an adhesion promoting buffer layer between a lens substrate and a hard coating layer is well-known in the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Freeman whose telephone number is (571)270-3469. The examiner can normally be reached on Monday-Friday 9:00-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571)272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John Freeman
Examiner
Art Unit 1787

/John Freeman/
Examiner, Art Unit 1787

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1787